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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/486,864	06/08/2000	ISAO KAKUHARI	28569.5100	2403
20322	7590	03/10/2006	EXAMINER	
SNELL & WILMER ONE ARIZONA CENTER 400 EAST VAN BUREN PHOENIX, AZ 850040001			FAULK, DEVONA E	
		ART UNIT	PAPER NUMBER	
		2644		

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/486,864	KAKUHARI ET AL.
	Examiner Devona E. Faulk	Art Unit 2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 15 December 2005.

2a) This action is FINAL.                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 21,22,24-30 and 33 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 21,22,24,29 and 30 is/are rejected.

7) Claim(s) 25-28 and 33 is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 9/30/2005

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_

5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_

## DETAILED ACTION

### ***Response to Arguments***

1. Applicant's arguments, filed 12/15/2005, with respect to the rejection(s) of claim(s) under 103(a), particularly regarding the Weingartner reference, have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Greenberger.

2. Claims 1-20,23,31,32 are cancelled.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 21,24 and 29** are rejected under 35 U.S.C. 102(b) as being unpatentable over Zong et al. (EP 0 239 914) in view of Kehry et al. (DE 38 44 572) in further view of Hayakawa (JP 06072253).

Regarding **claim 21**, Zong discloses an-on vehicle sound amplification device located outside a vehicle ( electronic loudspeaker system including an amplifier that is mounted externally to a transport vehicle and can be used for public addressing. See abstract; column 2, lines 2-12; claim 1) comprising a loudspeaker, signal processing

means (3, Figure 1) for amplifying an acoustic signal and then inputting an output thereof to the loudspeaker.

Zong further teaches of an indicating lamp connected to the driver operation switch (sound level control switch) that will turn on when the sound level is very high so that the policeman or whoever the driver is can monitor the sound level (column 4, lines 37-46). He further teaches that the loudspeaker arrangement promotes safe driving (column 4, lines 55-57).

Zong fails to disclose that the loudspeaker system is a dipole speaker.

Kehry discloses roof-mounted dipole speakers (Figure 2). Speakers 11 and 13 are dipole speakers (speaker 11 is outputted in one direction through funnel 12 and speaker 13 is outputted in an opposite direction through funnel 14). The axis of radiation of the speakers extends at least in horizontal direction beyond the inherent passenger compartment which reads on at least one acoustic radiation axis thereof is directed outwardly from a vehicle interior.

It would have been obvious to use Kehry's concept of dipole speakers mounted outside a vehicle in order to emit sound in rearward and forward directions.

Zong as modified by Kehry reads on the loudspeakers arranged so that respective acoustic radiation planes are directed opposite each other. Zong as modified by Kehry fails to disclose a signal processing means that controls phase as claimed.

Hayakawa teaches of a signal processing means that controls a phase as claimed (phase of the signal to each sound source changes with the signal processing means (page 2, paragraph 10)). It would have been obvious to one of ordinary skill in

the art at the time of the invention to use Hayakawa's concept of a signal processing means controlling the phase in order to control the location of sound image.

Regarding **claim 24**, Zong as modified by Kehry and Hayakawa disclose claims wherein each of the at least two loudspeakers included in the dipole sound source has an acoustic tube whose cross-sectional area along a direction perpendicular to a sound wave traveling direction varies continuously; the acoustic tubes of the respective loudspeakers are arranged so that respective acoustic radiation planes thereof are directed opposite to each other; and a radiated sound from the loudspeaker which is driven by an output from the signal processing means is radiated by being guided along the acoustic tube (Hayakawa teaches of dipole sound sources are each horn speakers (11a,11b; 12a,12b)(page 2, paragraph 24). The horn speakers read on "acoustic tubes" as claimed.

Regarding **claim 29**, Zong as modified by Kehry and Hayakawa disclose wherein the acoustic tube of each of the at least two loudspeakers included in the dipole sound source is formed of a sound path having a desired bent shape. It is interpreted that the acoustic tube or horn is formed of a sound path having a desired bent shape.

5. **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over Zong et al. (EP 0 239 914) in view of Kehry et al. (DE 38 44 572) in further view of Hayakawa (JP 06-072253) in further view of Dodge (U.S. Patent 4,460,061).

Regarding **claim 30**, Zong as modified by Kehry and Hayakawa fail to disclose wherein the at least two loudspeakers included in the dipole sound source are arranged so that an interval between the respective acoustic radiation planes included in the

acoustic tubes of the loudspeaker s is less than or equal to approximately  $\frac{1}{2}$  of the wavelength of the reproduced sound.

Dodge discloses an apparatus of increasing the directivity of a sound source. He further teaches in Figure 1 of two sources spaced vertically by approximately  $\frac{1}{2}$  (column1, lines 60-63; column 2, lines 18-34). Thus it would have been obvious to have the loudspeakers arranged as claimed in order to increase the signal intensity of the sound sources.

6. **Claim 33** is rejected under 35 U.S.C. 103(a) as being unpatentable over Zong et al. (EP 0 239 914) in view of Kehry et al. (DE 38 44 572) in view of Hayakawa (JP 06072253) in further view of Sharp (U.S. Patent 3,781,475).

Regarding **claim 33**, Zong as modified by Kehry and Hayakawa disclose the dipole sound source comprising an amplified sound source for radiating an amplified sound and a control sound source for radiating a control sound.

Zong as modified by Kehry and Hayakawa fails to disclose wherein an acoustic plane of the control sound source are placed such that a difference between a phase of the amplified sound and a phase of the control sound at a desired frequency is substantially within 90° in a direction along a main axis of acoustic radiation of the amplified sound.

Sharp teaches of two speakers mounted in opposite directions (Figure 3; column 3, lines 10-12) having a phase difference of 90° (column 3, lines 14-23). Thus it would have been obvious to one of ordinary skill in the art at time of filing to have the sound

sources mounted to have the phase difference as claimed in order to produce an asymmetrical sound radiation pattern.

7. **Claims 22** is rejected under 35 U.S.C. 102(b) as being unpatentable over Hayakawa (JP 06072253) in view of Greenberger (U.S. Patent 5,870,484).

Regarding **claim 22**, Hayakawa discloses an on-vehicle sound-amplification apparatus (indoor sound system (Figure 1), comprising:

a dipole sound source (11, 12) (See abstract) provided in the vicinity of a position of a passenger wherein at least one acoustic radiation axis thereof is directed outwardly from a vehicle interior (Figure 1);

a signal processing means for amplifying an acoustic signal and then inputting an output thereof to the dipole sound source ( digital signal processor (16) (Figure 2) (page 3, paragraph 29);

Hayakawa fails to disclose a non-directional sound source provided in a vicinity of a center of the dipole sound source wherein an acoustic radiation thereof is driven to have an inverted phase from that of the acoustic radiation of the dipole sound source which is directed into the vehicle interior wherein the output form the signals processing means is also input to the non–directional speaker.

Greenberger discloses loudspeaker arrays with signal dependent radiation patterns and the concept wherein in one array comprises a two set of speakers placed in a dipole setup and a third speaker (Figures 5b and 5c applicable to a vehicle);column 90, lines 27-32) . The third speaker is obviously non-directional because there is nothing

opposing its directivity. If the signal were supplied then to the dipole speaker then it would implicitly be supplied to the non-directional speaker as well.

Thus it would have been obvious to one of ordinary skill in the art to have a non-directional speaker provided as claimed for the benefit of steering the higher frequency radiation lobes in direction directions.

### ***Claim Objections***

8. **Claims 25-28,33** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 571-272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DEF



VIVIAN CHIN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600